

species; and hence may have arisen some confusion. Our own species I suppose to correspond with the *T. intermedium*, Schrad. of Koch's Synopsis; and with the var. β . *fulvipes* there described. Some of the specimens agree.

Although in its full-grown state *Thesium linophyllum* is evidently parasitical, it presents several characters at variance with those required by a true parasite; and at the conclusion of some experiments in which I am at present engaged, I hope to make some addition to its history as well as to that of *Cuscuta*.

TAB. IV. *Fig 1.* represents the root of *Thesium linophyllum* attached to the roots of its supporters; *f. 2.* A slightly magnified tubercle attached to a large root; *f. 3.* A longitudinal section of a tubercle, shewing the spongiolæ inserted into the root of *Lotus corniculatus*; magnified; *f. 4.* A transverse section of the same parts; magnified.

New LICHENS, principally from the Herbarium of SIR WILLIAM J. HOOKER; by THOMAS TAYLOR, M.D.

LECIDEA, Ach.

1. *L. crystallifera*, Tayl.; crusta cornea, squamosa, concava, cinerascens, solidangulato-rimosa, subtus nigrescens; apotheciis majoribus, substipitatis, atro-glauciscentibus, marginem tenuem demum excludentibus.

HAB. On sandy clay; Swan River; *Mr. James Drummond*.—Scales crowded, their surface composed of semipellucid, very pale brown, solid-angular pieces; beneath there is a layer of greenish granules, resting on a layer of snow-white, dense matter, which likewise rising up in certain spots, forms the obconical stipes of the apothecium. Disk of the apothecia dark and glaucous: lamina pale brown, vertically striated. In very young apothecia the white substance appears as a thin border. The thallus is unlike that of any of the *Lepidomæ* of Acharius.

2. *L. glauca*, Tayl.; thallo granulato, granulis majoribus, confertis, subrotundis, subrugosis, albis; apotheciis atris, convexiusculis, subconfluentibus, disco pruinoso, margine undulato, nigerrimo, demum excluso.

HAB. Swan River; on clay; *Mr. James Drummond*.—The grains of the thallus are tumid, subangulate, but scarcely lobate. A vertical section of the apothecium shews a thin pellucid lamina which is striated; the disc beset with dark points, the emerging summits of the thecæ, and the lamina resting on a thick layer of black matter. This is principally distinguished from *L. confluens*, Ach. by the more rotundate and convex thallocal scales, as well as by the absence of any black substratum.

3. *L. multiflora*, Tayl.; thallo granulato, granulis minutissimis, confertis, subrotundis, tumidis, subrugosis, albidis, demum in gemmas pulveraceas, fusco-olivaceas erumpentibus; apotheciis minutis, aggregatis, subsessilibus, siccitate atris, madore rufo-fuscescentibus, disco scabro, convexo, margine crasso, vix elevato.

HAB. On bark; Swan River; *Mr. James Drummond*.—Thallus extended, creeping, without any distinct border, when dry of so dark an olive colour that the apothecia are not to be distinguished by the naked eye: the young thallus whitish. A vertical section of the lamina shows under a dark primrose disc a rather thick, striated rufescent layer resting on whitish cortical matter of the thallus. *L. scabrosa*, Ach., is larger in all its parts, and has very conspicuous apothecia, whose lamina is bluish and rests on brown matter.

4. *L. lateritia*, Tayl.; thallo subtus nigro-tomentoso, squamuloso, squamis sparsis, citrinis aurantiacisque lobatis, lobis minutissimis; apotheciis rubro-aurantiacis, siccitate concavis, urceolatis, madore convexiusculis, margine tenui, pallidiori, undulato crenatoque.

HAB. On rocks; Swan River; *Mr. James Drummond*.—This differs from *Lecanora elegans*, Ach., by its tomentose in-

ferior surface. The apothecia are much larger than the thallocal scales.

5. *L. humigena*, Tayl.; thalli substrato cuticuloso, gelatinoso, albido; verrucis sparsis, subhæmispheericis, minutissime tuberculatis, fuscis; gemmis granulatis, confertis, minutis, oblongis, subangularibus; apotheciis virescentibus, hæmispheericis, subpellucidis, pallide brunneis, immarginatis, disco scabrigo.

HAB. On wet clay banks; Dunkerron; County of Kerry.—Patches two inches wide, to the naked eye of an obscure green. Warts exteriorly shining and dark brown, interiorly pale and pellucid, very rugged, with opaque prominences, which are larger than the buds. Disc of the apothecia subrugose, pellucid, the lamina rather shallow, very pellucid, strongly striated, resting on pale brown pellucid cellular matter. This can scarcely be confounded with *L. vernalis*, Ach. On a gelatinous substratum are fixed both the warts and the buds, also unconnected, either of them, the apothecia. These, again, are without any margin; indeed without any distinct tunic to contain the lamina.

6. *L. icterica*, Tayl.; thallo pulverulento, citrino, tenuissimo, demum nigricante, substrato albo; apotheciis numerosis, minutis, sparsis, vitellinis, disco convexiusculo, margine pallidiori, integro.

HAB. On limestone; Dunkerron; county of Kerry.—Thallus conspicuous in pale yellow, soft, thin, powdery patches one or two inches wide; apothecia scarcely visible to the naked eye. Approaches to *Lichen erythrellus*, Engl. Bot.; the thallus, however, is much thinner, more powdery, of a livelier yellow colour, and is bordered by the white projecting substratum; the apothecia are always more minute. Watched for more than twenty years, it is true to the above characters.

7. *L. Kaleida*, Tayl.; thalli substrato tenui atro, squamis minutis, planis, subrotundis, sublobatis, virescentibus, sub-

pruinosis; apotheciis immersis, disco nigro-pruinoso, margine tenui, demum obsoleto.

HAB. On transition rocks facing the south; Dunkerron, County of Kerry.—Patches two inches or more wide; when wet the substratum and scales become very distinct; when dry appearing as a confused dusky greenish-grey powder. The scales on which the apothecia are fixed are by far the largest. Dissection shews beneath a brownish-black disc a shallow semipellucid, striated brown lamina, resting on much opaque brown matter.

8. *L. endochlora*, Tayl.; thalli squamis confertis, incrassatis, angulato-rotundatis, demum convexis, albis, intus viridiflavicantibus, marginatis, periphericis radiato-lobatis; apotheciis sessilibus, minutis, disco rufescenti, margine pallidiori, demum excluso.

HAB. On sand; Mendoza; *Gillies, Hook. herb.*—Scales crowded, minute, white except where the cuticle is abraded, where they are yellowish-green. Lamina reddish-brown, paler than the disc. This species would rank among the *Psoræ* of Hoffmann.

9. *L. emergens*, Tayl.; crusta tenui, leproso-membranacea, pallide rufescenti-lutea, verrucis minutissimis albidis conspersa, nigro-limitata; apotheciis confertis, erumpentibus, planis, nigro-pruinosis, intus albidis, margine aterrimo, flexuoso, subintegerrimo.

HAB. On bark; St. Vincent; *Rev. L. Guilding, Hook. herb.*—Thallus 2-3 inches wide, thin as cuticle. Disc of the apothecia pruinose and black, while the lamina, which is white, presents here and there blackish, erect, parallel thecæ.—*L. albi-cærulescens*, Ach. has a whitish and tereous crust.

10. *L. Mauritiana*, Tayl.; squamis imbricatis atque confluentibus, subrotundis, minutis, margine lobatis crenatisque, flavo-olivaceis, subtus albo-fibrillosis, demum atro-spongiosis; apotheciis interstitialibus, quam squamis majoribus, convexis, lutescenti-fuscis, subimmarginatis.

HAB.—On bark; Mauritius; *Hook. herb.*—Patches 1-2

inches wide, yellowish-ash coloured, unaltered by moisture. The nascent scale is at first subrotund, and sends out from beneath on all sides white fibres in a stellate manner; at length the scale becomes crenate, then incised and effigurate at the margin. The patch rests on a thick cushion of dark interlacing fibres. Young apothecia are sometimes seen growing on the discs of the aged ones. Lamina very shallow and transparent; through it is seen the colouring matter of the apothecium, lying beneath in a dense layer, and even extending downwards at the centre, and forming a kind of stipes.

CALICIUM, *Ach.*

1. *C. glabellum*, Tayl.; thallo tenui, leproso, rimoso, albisimo; apotheciis stipitum apicibus immersis, disco pruinoso, stipitibus fasciculatis, subulatis, lævigatis, rigidis, aterrimis, subdecurvis.

HAB.—On rotten wood; Bear Lake, North America; *Richardson, Hook. herb.*—Patches several inches wide, conspicuously white; thallus filmy, closely investing, here and there in flattened elevations. The substellate fasciculi of footstalks usually follow the course of some chink, and are visible to the naked eye; their tops, when closely inspected, contain immersed the minute apothecia. This approaches nearest to *C. proboscidale*, *Ach.*, whose thallus, however, is of an ash colour and more floccose, while the apothecia are turbinate. The *Calicia* probably might be more naturally placed among the *Fungi* than the Lichens.

GRAPHIS, *Ach.*

1. *G. anguillæformis*, Tayl.; thallo tenui, membranaceo, albidulo, continuo, lævigato, ruguloso, obscure nigro-limitato; apotheciis sparsis elevato-sessilibus, subsimplicibus, elongatis, flexuosis, disco atro, rimæformi, margine thallose albissimo, subinflexo.

HAB. On trees; St. Vincent's; *Hook. herb.*—Thallus some-

what shining. Lirellæ nearly four lines long, rather obtuse at each end, and twisted as eels in motion; they are by no means immersed, according to the generic character of Acharius.

VERRUCARIA, *Ach.*

1. *V. aspera*, Tayl.; thallo illimitato, tartareo, areolato, areolarum marginibus elevatis, nigro-pruinoso, siccitate atro, madore fusco; apotheciis plurimis, immersis, apicibus minutis, glabris, aterrimis, poro inconspicuo.

HAB. On rocks facing the south; Dunkerron, County of Kerry.—Patches often four inches wide, at a distance resembling a coarse black powder. Thallus, by transmitted light in water, appears a greenish-olive membrane covered with coarse black pruina, while the tops of the apothecia become conspicuously black. The black perithecium passes beneath the globose, pale, gelatinous nucleus. In *Verrucaria Maura*, Ach. the thallus is composed beneath of thick, black, tartareous matter; besides the apothecia have their summits larger, flatter, and not contrastedly black in the wet state.

2. *V. imbrida*, Tayl.; thallo illimitato, tenui, tartareo, æquali, rimoso, fusco-nigricante, madore subolivaceo, sublucido; apotheciis minutis, immersis, poro latiori, marginato, nucleo pallide olivaceo.

HAB. On smooth rocks near the spray of waterfalls; county of Kerry.—Patches seldom two inches wide, thin and lying close to the rock. Thallus smooth, with the lustre of the fracture of charcoal; when wet appearing soft and brownish-olive, when dry of a purplish black. Apothecia not distinct to the naked eye. The thallus bruised in water shews a reddish layer near to the surface. Perithecium pellucid, reddish-brown; there is besides an opaque covering from the thallus.

3. *V. melaspora*, Tayl.; thallo illimitato, verrucis tartareis, minutis confertis atque confluentibus, albidis, planiusculis,

siccitate subrimosis, fuscescentibus; apotheciis plurimis, sparsis, basi subimmersis, atris, submamillatis.

HAB. On wet mural rocks, Carig Mountain; County of Kerry.—Patches six inches wide. Thallus under water very white; under the lens a sordid greenish hue is here and there perceptible. The surface is wrinkled into white flattish confluent ridges. Apothecia various in size, their tops often flattened and irregular, dimpled or globosconical. The shell is thick, black, opaque and arched over the nucleus, which is dark from containing numerous ovate, opaque, reticulated, separate or clustered thecæ; besides, the nucleus contains semipellucid subcylindrical bodies, much longer and larger, without any reticulations, but studded with minute pores. Such, perhaps, are the male flowers. This species is allied to *V. gemmifera*, Tayl.: the surface of the thallus, however, is more uneven, there is no limit to the patch; and the apothecia are far larger; while the shell is deficient below the nucleus.

4. *V. rhodosticta*, Tayl.; thallo subtartareo, tenui, verrucoso, verrucis hic illic aggregatis, siccitate purpureo-nigris, madore subgelatinosis, rufescentibus, minute corrugatis; apotheciis sparsis, subglobosis, scabridis, concoloribus.

HAB. On wet rocks, near Sheen Bridge; County of Kerry.—When moistened, the warts appear as rose-brown opaque cells connected by a thin substance of a paler colour, lying on a layer of pale greenish matter. Pores large. The perithecium is homogeneous with the warts; the nucleus very pale reddish-brown, gelatinous and striated. It is allied to our *V. imbrida*.

5. *V. littoralis*, Tayl.; thallo olivaceo-limitato, subtartareo, tenui, lævigato, subcontinuo, rufescenti-atro-purpureo, madore subgelatinoso, pellucido; apotheciis minutissimis, immersis, subconfertis, porosis.

HAB. Very common on the sea-shore, on rocks and stones wetted by the tide; Ireland.—Patches sometimes several yards in extent. Thallus smooth, slippery, very thin. Pores

of the apothecia with an elevated border : there is no second perithecium passing beneath the nucleus, which is gelatinous, pale, oblong-spheroid, studded with opaque points among which oblong bodies occur. Probably the minuteness of the apothecia have caused this very common Lichen to remain unrecognised.

ENDOCARPON, *Hedwig*.

1. *E. Wightii*, Tayl.; thallo crustaceo, tenui, contiguo, cinereo-virescenti, margine depresso, albidiori; ostiolis sparsis, depressis, thalli albis, perithecii nigris marginatis, nucleo-hyalino, thecis nigris.

HAB. Madras, *Dr. Wight, Hook. herb.*—Thallus spreading as a continuous, uneven crust, two or three inches in diameter; moistened, the surface presents minute, thickly set, oblong, green granules; when the thallus is broken and beneath the apothecia minute blood-red particles are observable. The nucleus issues as a narrow scarious neck out of the black marginate pore, which again is surrounded by a circular ring of white thallus. This species has some resemblance to *V. epigeia*, Ach., but has neither the sub-fibrose thallus, or prominent apothecia of the latter.

2. *E. peltatum*, Tayl.; thallo corneo, foliaceo, orbiculari, peltato, flavescenti-cinereo, bibulo, areolato, areolis subrotundis, madore minute rugosis, contiguis, subtus atrolanuginoso, margine recurvo, integro demum diffracto; apotheciis sparsis, nucleo immerso lamina nigra emergente tecto.

HAB. Near Zwartkop River; Cape of Good Hope; *Zeyher, Hook. herb.*—Thallus in contiguous scales, more than one inch wide, fixed down by the centre, above which it is concave, but with recurved margins; fawn-coloured, unaltered by moisture. The apothecia are few, have no aperture above, but a black, slightly convex layer, covering a roundish transparent nucleus as in the figures in Acharius's *Lich. Univ.* of a *Sagedia*. The colour and areolate thallus keep this species distinct from *E. miniatum*, Ach.

3. *E. speireum*, Tayl.; thallo aggregato, cartilagineo, peltato, rotundato, undulato, sublobato, demum convexo, margine albido, integro, obscure carneo, lævi, subtus concolori, lanuginoso; apotheciis submarginalibus, globosis, atris, basi subimmersis.

HAB. On the ground; Bushman's country, Cape of Good Hope; *Zeyher, Hook. herb.*—Thallus nearly three lines in diameter; when dry concave; tumid and flesh-coloured when moistened. A vertical section shews beneath a pruinose surface a brick-coloured layer, supported on a shallower one of a green parenchymatous substance resting on a white cuticular substratum. The apothecia depart from the generic character of Acharius, by being without pores and scarcely immersed; they consist of a dense blackish perithecium containing a hollow semitransparent, brown nucleus, whose centre is filled with opaque whitish matter. The roots are remarkable, being often four lines long, whitish, the main ones thick and acuminate, densely covered with branched, excessively fine colourless fibrils. It is somewhat allied to the following. It is perhaps *Lichen incarnatus*, Thunberg, which Acharius makes *Psora decipiens*, Hoffm.

4. *E. crenatum*, Tayl.; thallo aggregato, rotundato, cartilagineo, convexiusculo, peltato, rufescenti-carneo, pruinoso, margine albido, crenato, subtus concolori; apotheciis marginalibus, confertis, majoribus, semi-immersis, rufo-carneis.

HAB. On the ground, near the Salt-pan of the Zwartkop River, Uitenhage; *Zeyher, Hook. herb.*—Thallus scarcely two lines wide; the margins raised and free, white beneath; no green parenchymatous matter is observable in the layers. Apothecia flattish, half-immersed, covered with a reddish-brown pruina; the lamina semitransparent, pale brown, resting on a red shallow layer, the entire supported by the cuticular portion. Roots as in the preceding, to which it is allied, and so recedes from the generic character of *Endocarpon*: the colour of the orbicular concave thallus is similar; but the border of the present species is crenate;

and the apothecia are not black, not so spherical, nor so much raised above the thallus.

TRYPETHELIUM, *Ach.*

1. *T. luteum*, Tayl.; squamis tumidis, luteis, oblongo-rotundatis, demum confluentibus, convexis; substrato atro, interstitiali, elevato, gemmas albidas granulatas ferente; verrucis tenuibus lutescentibus; apotheciis elevatis, solitariis binisve, atris, poro latiori.

HAB. On bark; Madras; *Dr. Wight, Hook. herb.*—Patches nearly two inches wide. Scales when dry of a tawney ash colour, when wet deep tawney, rather evenly scattered: in the interstices black tartareous matter rises above the level of the scales. The stroma or covering of the perithecium is thin, tawney, sometimes disappearing by age: the hard black perithecium surrounds the pale gelatinous nucleus. To this species the white granular buds on the interstitial matter seem peculiar.

2. *T. bicolor*, Tayl.; crusta pallide lutescenti, tenui, continua, inæquali; verrucis subprominentibus, angustis, flexuosis, confluentibus, pruinosis, rufescenti-brunneis, albido-limitatis; ostiolis minutis, crebris, subemergentibus, atris.

HAB. On bark; Howison's Poort, near Graham's Town; *Zeyher, Hook. herb.*—Patches wide. Crust very thin, with numerous evenly scattered smooth convex elevations, in the hollows of which the warts occur of a purplish-fawn colour. Perithecium black, enclosing the pale gelatinous nucleus: this exhibits under a lens aggregate filiform vessels, among which are some much wider, containing numerous colourless, contiguous, spherical sporules. By the depressed warts it is allied to *T. porosum*, *Ach.*; but the colour of the crust, different from that of the verrucæ, and these last, more elongated and flexuose, easily distinguish our species.

VARIOLARIA, *Ach.*

1. *V. carnea*, Tayl.; crusta tenui, cinereo-alba, nigro-limi-

tata, minutissime granulata, granulis convexiusculis, rugosis, demum erumpentibus; apotheciis convexis, immarginatis, pruina alba crassa tectis, disco carneo.

HAB. On bark; Brazil; *Hook. herb.*—Thallus about two inches wide, whitish ash-coloured, not altered by moisture; but the discs of the apothecia when wetted assume a deeper colour. The surface of the thallus is minutely wrinkled or covered with contiguous flattish granules, which sometimes bursting at their tops, emit buds in the form of a whitish powder. Apothecia of the size of poppy seeds, at first covered with a coarse white powder.

URCEOLARIA, *Ach.*

1. *U. citrina*, Tayl.; hypothallo atro; thallo citrino, squamis subrotundis, compressis, sublobatis, minutis; apotheciis immersis, punctiformibus, angulatis, pallidioribus, immarginatis, subconfluentibus.

HAB. On rocks, Swan River; *Mr. James Drummond.*—Patches of crowded scales several inches wide: the black tartareous substratum rising up in the interstices of the scales. In most respects allied to *U. Acharii*, Ach.; but the colour is that of *Lecanora citrina*, Ach. Apothecia, solitary or two together, contorted, occur on each fertile scale.

2. *U. tessellata*, Tayl.; hypothallo atro, sparso, crusta rimoso-areolata, subverrucosa, rubella, areolis planis, lævibus, intus flavescentibus; apotheciis minutis, lamina prolifera demum exserta, convexiuscula, pallide citrina, margine subintegerrimo.

HAB. On quartz rock; Swan River; *Mr. James Drummond.*—Patches wide, closely investing. The areolæ may be considered crowded flattish warts; whose margins when moistened appear subcrenate; the colour is deep brick-red. The thallocal coloured part of the apothecium does not pass beneath the lamina. Differs from *U. diamorta*, Ach., by the more orange colour of the thallus and the discs of the apothecia being pale yellow, not black.

LECANORA, *Ach.*

1. *L. vigilans*, Tayl.; crusta tartarea, tenui, rugulosa, alba, nigro-limitata; gemmis minutissime granulatis; apotheciis sparsis, majoribus, convexis, disco rufescenti, pruinoso, intus fusco-albidis, margine incrassato integerrimo, subundulato, rufo-cinereo.

HAB. On bark, Mauritius. Casapí, Peru; *Mathews, Hook. herb.*—Patches 1-2 inches wide; thallus thin, assuming the irregular surface of the bark on which it grows. The buds are minute granules, sometimes tipped with brown. Apothecia a little larger than turnep-seed. A vertical section shews a thin dark layer interposed between the lamina and white thallocal matter. The black limit to the crust, the entire border of the apothecia, and the minute granular buds distinguish this species from *L. subfusca*, Ach.

2. *L. millegrana*, Tayl.; thalli tartarei granulis confertis, planiusculis, subconfluentibus, albido-olivaceis, madore virescentibus, minutissimis, inæqualibus; apotheciis minutis, convexis, aggregatis, disco rufescenti, pruinoso, intus albidis, margine pallide fusco, integerrimo.

HAB. No. 589. On trees; Buenos Ayres; *Tweedie, Hook. herb.*—Patch 1-2 inches wide, without any distinct border, obscurely pale olive-green, very rough; granules scarcely lobate. Apothecia when moistened dark brownish-red, interiorly very pale brown. This differs from a mountain variety of *L. subfusca*, Ach. common in Ireland, by the entire border of the apothecia and the crowded tumid granules of the thallus. It, perhaps, may be considered a *Biatora* of Acharius.

3. *L. epiphora*, Tayl.; thallo cartilagineo, areolato-rimoso, rugoso, albido-cinereo, nigro-limitato; gemmis minutis, granulatis, demum pulverem flavicantem emittentibus; apotheciis prolifero-conglomeratis, disco plano, scabro, aurantiaco, margine thallocal demum crenulato, gemmifero.

HAB. On bark; St. Vincent's; *Rev. L. Guilding, Hook. herb.*

—Thallus 2 or 3 inches wide, very thin, whitish but with a yellow hue from the powder of the buds. Aged apothecia frequently proliferous. Beneath a disk of dusky orange pruina is a transparent and colourless lamina, resting on whitish cortical matter. This may be known from *Lecidea aurantiaca*, Ach., by the thallodal border of the apothecia, and by the yellow buds on the surface of the thallus, and on the margins of the apothecia.

4. *L. bibula*, Tayl.; hypothallo albo, filamentoso, implexo; thalli granulis subvillosis, subrotundis, planiusculis, confertis, pallidissime virentibus; apotheciis sparsis, fuscorufis, demum convexis, margine thallode tenuissimo, evanescente.

HAB. 1648. On bark; Juan Fernandez; *Hook. herb.*—

Patches 2 or 3 inches wide; readily imbibing water; when the thallus swells, the granules have very minute lobes. The lamina is very shallow and transparent, resting upon much brownish-red matter which gives the colour to the apothecia.

5. *L. comminuta*, Tayl.; thallo disperso, squamis minutissimis, rotundatis, confertis, convexis, subintegerrimis, pallide sulphureis; hypothallo tenui, atro; apotheciis quam thalli squamis majoribus, disco convexiusculo, nigropruinoso, margine subundulato, integerrimo.

HAB. On rocks; Dunkerron, county of Kerry.—Patches two inches wide, to the naked eye appearing as the fine powder of sulphur scattered on a blackish ground: the colour is not altered by moisture: under a lens the round scales are distinct. It may be known from *L. intricata*, Ach., by its more dispersed substratum, by the far minuter scales, by the convex disk of the apothecia; and principally by the diameter far exceeding that of the thallodal scales. This is the variety β . *comminuta* of *L. intricata* in *Flora Hibernica*.

6. *L. Drummondii*, Tayl.; thallo granulato-lobato, citrino, pruinoso, lobis brevissimis, concretis, subradiantibus,

tumidis, margine decurvis; hypothallo nigricante; gemmis minutissimis, granulatis, concoloribus; apotheciis interstitialibus, majoribus, olivaceo-carneis, planiusculis, flexuosis, margine demum crenulato, albido.

HAB. On rocks; Swan River; *Mr. J. Drummond*.—Scales aggregate, as in *L. fulgens*, Ach. The old thallus becomes pulverulent, and whitish. Disks of the apothecia, when moistened, greenish. From *L. fulgens*, Ach., ours differ by the minuter thallus, the black substratum and the apothecia occurring in the interstices of the scales, being too of a greater size and more olive colour.

7. *L. erythrosticta*, Tayl.; thallo illimitato, leproso, albido, demum nigricante; apotheciis confertis, convexiusculis, demum immarginatis, saturate aurantiacis; gemmis pulveraceo-granulatis, concoloribus.

HAB. On bark; Swan River; *Mr. James Drummond*.—Patches 5—6 inches wide; thallus very thin. Buds and disks of the apothecia reddish-orange; the latter interiorly pale greenish-yellow. More red than any variety of *L. citrina*, Ach.: the scales, too, are more distinctly lobed, and turn green when moistened.

PARMELIA, Ach.

1. *P. albo-plumbea*, Tayl.; thallo rotundato albido plumbeoque, lobis linearibus, dilatatis, crenatis, subtus albido-fibrilloso atque nigro-tomentoso; gemmis subrotundis, demum confluentibus, pulverem album crassum effundentibus.

HAB. Swan River; *Mr. James Drummond*.—Thallus 1-2 inches wide: central lobes elongate, convex; the marginal ones rather concave, but their border deflexed. Allied to *P. pulverulenta*, Ach.: the surface, however, is more irregular, and the buds more prominent. When moistened the colour is unaltered.

2. *P. imitatrix*, Tayl.; thallo orbiculari, olivaceo-fusco, subtus nigro-fibrilloso; lobis linearibus, sinuato-radiantibus,

crenatis, lævigatis, rugosis; gemmis subrotundis; apotheciis planiusculis, disco concolori, margine subintegerrimo, dorso corrugato.

HAB. Swan River; *Mr. James Drummond*.—It requires attentive examination to separate the present species from *P. olivacea*, Ach. The lobes of the thallus are more elongated, their surface smooth, never rough with rigid points: the margins of the apothecia are quite entire; and their under surface is much wrinkled. When moistened the surface of the thallus assumes a yellowish hue.

3. *P. incisa*, Tayl.; thallo suborbiculari, lævigato, inæquali, pallidissime sulphureo, subtus nigricante, lobis incisis, sinuatis, margine inæquali adscendente; gemmis marginalibus, granulatis, planiusculis; apotheciis sessilibus, margine incurvo, tumido, subdiviso, lævi, disco concavo, fusco.

HAB. Swan River; *Mr. James Drummond*.—Thallus nearly eight inches wide: margins of the lobes usually blackish: laciniae imbricated, attached beneath by very short blackish processes. *P. liliacea*, Ach., it has the lobes more deeply divided; while the pruina on the surface of that species as well as the black fibrils beneath are entirely wanting.

4. *P. scabrosa*, Tayl.; thallo suborbiculari, inciso, pallidissime sulphureo, subtus nudo, nigricante, lobis elongatis, convexis, breviter laciniatis; gemmis angulato-granulatis, demum in pulverem album erumpentibus; apotheciis subsessilibus, concavis, margine incurvo, crenulato, disco fuscescente.

HAB. Swan River; *Mr. James Drummond*.—Thallus 1—2 inches wide, pale, wrinkled, naked beneath. Buds central. It resembles *P. saxatilis*, Ach.; but the surface is destitute of reticulating ridges, and there are no elongated fibrils beneath the thallus.

5. *P. atrocapilla*, Tayl.; thallo minuto, conferto, albissimo, lineari, angulato, minute sinuato, lobis brevibus, rotundatis, sinubus oblongis, subtus nigro-fibrillosis, tricis

confertis, atris; gemmis marginalibus, minutis, albido-pulverulentis, demum explanatis.

HAB. Nepal; *Wallich*.—Patches very white, several inches wide, but consisting of crowded, minute thalli, scarcely exceeding one quarter of an inch in length: the younger thalli are simple roundish disks. The grains of the buds separate and at length expand into new thalli. No apothecia observed.

6. *P. Caraccensis*, Tayl.; thallo laxe cæspitose, albido-virenti, lævigato, anguste lineari, dichotomo, supra canaliculato, subtus margineque densissime atro-villoso.

HAB. Caraccas; *J. Linden*, 576. *Hook. herb.* Near Quito; *Professor William Jameson*, 1845. — Thallus 5-6 inches long: laciniæ elongated, channelled, narrow, and thus distinguished from *P. sinuosa*, Ach.; besides it is not sinuato-pinnatifid, nor are the sinuses circular.

7. *P. carporrhizans*, Tayl.; thallo stellato, nudo, fusco-cinerascenti, minutissime albido-reticulato, subtus atro-fibrilloso, laciniis contiguis, subpinnatis, sinuato-lobatis, atro-marginatis, lobulis planis, sinubus ovalibus; gemmis granulatis; apotheciis initio sessilibus subglobosis, demum planis, disco rufo, margine tenui, crenulato, extus fibrillis atris radicantibus.

HAB. On bark; Canaries; *Dr. Lemann*, *Hook. herb.*—Thallus 5 inches in diameter, pale brownish ash-coloured, devoid of lustre, lobed like some varieties of *P. lævigata*, Ach., uneven, the more aged parts with transverse splits; attached to bark by short dense black fibrils: these at length, again appear on the backs of the apothecia and fixing them down to the thallus cause them to be quite flat. On the edges of the laciniæ a few white granules may, sometimes, be observed, which, elongating and flattening, are converted into thalli. The radicating apothecia show an affinity with *P. ulothrix*, Ach., from which the size, colour and lobes of the thallus, and the black fibrils of the under surface are sufficiently distinctive.

8. *P. conferta*, Tayl. ; thallo aggregato, albido, inciso-lobato, laciniis linearibus, subimbricatis, glabris, centralibus convexis, subtus margine concolori, medio nigrescente atque fixuris brevibus scabro ; gemmis granulatis, compressis ; apotheciis tubuloso-stipitatis, concavissimis, margine crenulato, demum gemmifero.

HAB. Van Diemen's Land ; *Mr. Borrer's herbarium*.—Thallus scarcely an inch wide ; several such, however, are clustered on bark and form wide patches ; the laciniæ, especially towards the centre of a patch, tumid but not hollow. The buds are frequently marginal ; they soon assume the flattened form, and expand into new thalli. Apothecia rise on considerable, hollow and wrinkled stalks ; the disk is very concave and of a light chesnut colour. The want of inflated lobes readily distinguishes this from *P. phylodes*, Ach.

9. *P. coralliphora*, Tayl. ; thallo stellato, albido-cinereo, multifido, laciniis approximatis, linearibus, convexiusculis, nigro-ciliatis, subtus margine albis, centro fixuris atris devincto ; gemmis sparsis, concoloribus, confertis, initio granulatis, statim cylindricis ; apotheciis submarginalibus, concavis, disco fusco-rufescenti, margine crasso, elevato, gemmis cylindricis densissimis coronato.

HAB. Casapí ; Peru ; *Mathews, Hook. herb.*—Patch several inches wide, with the habit of *P. speciosa*, Ach. : the laciniæ, however, are convex ; and the crowded cylindrical buds on the apothecia are very distinctive.

10. *P. cribellata*, Tayl. ; thallo orbiculari, cinereo-glaucos, rugoso, inciso-lobato, lobulis cristato-multifidis, crenatis, concaviusculis, subtus nigricantibus, inflatis, foraminulosis, rugosis ; apotheciis centralibus, majoribus, demum planiusculis, disco rufescenti, margine tenui demum crenulato, extus rugosis.

HAB. West coast of North America ; *Menzies*.—Patch 2 inches wide, very uneven. Lobes of the thallus varying in breadth, sometimes linear, sometimes rotundate in the

centre, with short linear terminal laciniae. Inferior surface smooth, inflated and pierced with minute holes, which distinguish it from its congeners.

11. *P. cristifera*, Tayl.; thallo orbiculari, albido, elevato-rugoso, glabro, lobis rotundatis, depressis, integerrimis, subtus margine nudo, glabro, castaneo, medio nigropunctato atque fixuris atris devincto; gemmis marginalibus, confertis, pulveraceis, concoloribus; apotheciis sparsis, concavis, disco pallide castaneo, margine incurvo, demum pulverulento.

HAB. Calcutta; *Wallich*. Mauritius; *Dr. Wright*. Brazil; *Gardner*. Demerara; *Mr. Parker, Hook. herb.*—Thallus 6-8 inches wide, cream-coloured, unaltered by moisture; the margins of the lobes at the central parts with conspicuous elevated crests of powdery buds. It is allied to *P. perlata*, Ach.; but the clusters of buds are more minute; and the inferior surface is destitute of black tricae.

12. *P. cylindophora*, Tayl.; thallo orbiculari, fusco-castaneo, stellato, rugoso, lobis sinuato-pinnatifidis, subimbricatis, laciniis convexis, crenatis, margine subtus pallentibus, tenuissime villosis; gemmis concoloribus, cylindricis, apice albidis.

HAB. Madras; *Dr. Wight, Hook. herb.*—Nearly four inches in diameter; dusky brownish-olive, somewhat greener, when moistened; central lobes wrinkled, convex, deflexed, the marginal rather concave. Buds often three or more clustered together; the margins of the laciniae and tops of the buds whitish. The cylindrical buds readily distinguish this species from *P. Aquila*, Ach., which it resembles in colour.

13. *P. diademata*, Tayl.; thallo stellato, glabro, undulato, cinerascete, subtus nigro, ramoso-fibrilloso, laciniis planis, linearibus, lobatis, crenatis; gemmis marginalibus, demum explanatis; apotheciis substipitatis, concavis, margine gemmis coronato, disco fusco.

HAB. Nepal; *Wallich*.—Thallus five inches wide, cartila-

gineo-membranaceous, the laciniae flexuose, imbricated, the margins crenate with flat roundish buds, which at first appear as specks of whitish powder; beneath are branched black tricæ. Upper surface brownish-grey. Disc of the apothecia dark reddish-brown. Strongly allied to *P. speciosa*, Ach., differing by the darker colour, the more uneven edges of the laciniae of the thallus, and by the flattish buds which reappear on the margins of the apothecia, giving them a crowned appearance.

14. *P. divaricata*, Tayl.; thallo laxo implexo, dichotomo, lineari-laciniato, suberecto, laciniis divaricatis, convexis, albescentibus, subtus canaliculatis, nigris, tricis atris, subsimplicibus, rigidis, gemmis subnullis; apotheciis subpedicellatis, subterminalibus, disco concavo, margine, subintegro.

HAB. Nepal; *Wallich*.—About two inches long; the more aged parts of the thallus of a tawney hue. Apothecia in all stages very concave, sessile on corrugated pedicels; their disc chestnut-coloured, their margins at length ruptured. From *Borrera leucomela*, Ach., the present differs by the fewer and more simple tricæ; by the more convex laciniae, whose margins, as well as those of the apothecia, are entire.

14. *P. echinata*, Tayl.; thallo aggregato, ramoso, adscendente, tenui, oblongo, concavo, albissime pruinoso, subinciso, subtus virescenti, tricis albidis echinato; gemmis planis, oblongis; apotheciis stipitatis, concavissimis, demum explanatis, atro-purpureis, margine gemmifero.

HAB. Brazil; *Mr. K. Leyland's herb*. Pennsylvania; *T. Drummond*.—Thallus minute, covered with a snow-white pruina, through which the pale pea-green colour of the rest of the thallus is observable, especially when moistened. The buds on the margins of the apothecia are minute radiating thalli, echinated beneath. The green colour of the inferior surface is singular.

15. *P. exsecta*, Tayl.; thallo suborbiculari, subpinnatifido, inciso-lobato, albido, lobis brevibus, linearibus, truncatis,

sinubus circularibus; gemmis terminalibus, minutis, rotundis, albidis, medio nigris; apotheciis concavis, rufo-castaneis, margine demum disrupto, incurvo.

HAB. Nepal; *Wallich*.—Thallus scarcely exceeding one inch; several, however, are crowded and imbricated, forming a considerable patch: the colour becomes slightly brown by age. The buds are circular openings at the extremities of the ultimate lobes, yielding a white powder at the rim, but black in the centre. The thallus is more deeply divided than in *P. lævigata*, Ach.; the buds are more minute, and do not yield a brown powder; and the apothecia in their most advanced stages have no powder on their margins.

16. *P. endoleuca*, Tayl.; thallo albido, tenuissimo, adnato, subtus nigro-fibrilloso, lobis multifidis, confertis, centralibus rugosis, marginalibus sinuato-laciniatis, laciniis lacero-truncatis; gemmis minutissime granulatis; apotheciis confertis, majoribus tenuioribus, planis, subflexuosis, intus albidis, subtus nigricantibus, disco subfusco, margine subintegerrimo.

HAB. n. 75. On bark; Swan River; *Mr. James Drummond*.—Patches 3-4 inches long. Thallus closely investing: apothecia prominent and very numerous; on their margins a few white granular buds may be observed. From ours, *P. ulothrix*, Ach. differs by its stellate thallus, its longer laciniæ: the apothecia, besides, are more concave and radiate exteriorly.

17. *P. Frankliniana*, Tayl.; thallo suborbiculari, inciso-lobato, flavo, nudo, subrugoso, subtus venoso, nudiusculo, lobis rotundatis, incisis, crenatis, planis, margine subplicatis; gemmis terminalibus, cristantibus, flavis, pulveraceis.

HAB.—Arctic regions; Franklin's first voyage; *Hook. herb.*—Patches scarcely two inches wide, usually much less, of a brilliant yellow, unaltered by moisture. Under the central parts of the thallus are a few whitish rootlets, but which at length turn black. The sinus between the lobes are nearly round. This can scarcely be confounded with

P. caperata, Ach., its thallus is far smaller, and its buds in powdery terminal crests of a bright gamboge yellow.

18. *P. fulvella*, Tayl.; thallo orbiculari, albido-fulvo, minutissime albo-punctato, glabro, lobis rotundatis, subrugosis, repando-crenatis, subtus lanugine pruinata concolori devinctis; gemmis marginalibus, statim lamelliformibus; apotheciis tubuloso-pedicellatis, concavis, disco rufescenti, margine tenui, inciso-crenato, extus villosis.

HAB. Casapí; Peru; *Mathews, Hook. herb.*—Thallus 1-2 inches wide, pale tawney ash-coloured, the surface somewhat reticulated with minute white dots; the colour is unaltered by moisture. The buds of the apothecia are villose, like the inferior surface of the thallus. By the tubular podetia of the apothecia it is allied to *P. perforata*, Ach.; differing essentially from that species by its conspicuous buds.

19. *P. fistulata*, Tayl.; thallo cæspitoso, procumbente, dichotomo, multifido, lævigato, albido, laciniis linearibus, convexis, margine recurvis, subtus atro-fibrillosis; gemmis albis minutissimis, confertis, subconfluentibus; apotheciis sessilibus, concavis, disco castaneo, margine incurvo, subintegerrimo.

HAB. Tondil; Argentine Republic; *Tweedie, Hook. herb. Monte Video; Darwin.*—Tufts several inches wide; lacinia almost cylindrical. The buds germinate principally at the tops of the lobes and expand into minute thalli.

20. *P. filamentosa*, Tayl.; thallo subcæspitoso, filamentoso, compressiusculo, laciniis dichotomis, divaricatis, intricatis, capillaceo-attenuatis, flavis; apotheciis sparsis, disco planiusculo, fulvo, margine tenui, albido, integerrimo.

HAB. On *Hepaticæ*; Ohio.—The only specimen seen was minute, but perfect. Tuft scarcely one inch wide: the older parts of the thallus whitish, with a faint tinge of yellow, the younger more deeply coloured, ultimate setaceous laciniae often fascicled. Buds scattered, most minute, flattened granules of the colour of yolk of eggs. Apothecia scarcely visible to the naked eye. The colour

of *Borrera exilis*, Ach., is white, and it is a more erect species.

21. *P. Hookeri*, Tayl.; thallo aggregato, albo, lineari, sinuato-inciso, lobulis pinnatifidis, sinibus subcircularibus, subtus atro, pannoso; gemmis minutis, cinerascentibus, granulatis, statim cylindricis, demum in thallum expandentibus; apotheciis marginalibus, planis, disco rufescenti, margine tenui, incurvo, demum gemmifero.

HAB. On bark; St. Vincent's; *Rev. L. Guilding, Hook. herb.*—The compound patch of thalli is rounded. Lobes incised as in *P. sinuosa*, Ach.; yet, not only is the colour of the thallus different, but the granulate and cylindrical buds are essentially distinctive.

22. *P. inæqualis*, Tayl.; thallo aggregato, pallide sulphureo, inciso-lobato, laciniis linearibus, flexuosis, ramosis, obtuse rugosis, planiusculis, subtus nigrescenti, margine tumentis; gemmis granulatis, confertis, confluentibus; apotheciis substipitatis, concavis, extus rugosis, margine demum gemmifero.

HAB. Van Diemen's Land; *Mr. Borrer's herb.*—Several thalli, each about one inch wide, occur, forming a large patch on the bark of trees, of a pale yellow colour; laciniæ imbricated, often dichotomous. Buds usually central. Disks of the apothecia dark brown, their margin incurved and crenulate. However tumid the terminations of the laciniæ of the lobes, they are never hollow as in *P. phytodes*, Ach.; the ramification and figure of the lobes is more like that of *P. incurva*, Ach.

23. *P. lamelligera*, Tayl.; thallo cæspitoso, compresso, glabro, albido-cinereo, subpinnatim dichotomo, laciniis convexiusculis, ultimis brevissimis, obtusis, nigro-ciliatis, subtus margine albis, centro fixuris nigris devincto; gemmis marginalibus, statim lamelliformibus.

HAB. On Casapí; Peru; *Mathews, Hook. herb.*—Patch several inches wide, consisting of numerous substellate or cuneate thalli, frequently with palmate lobes, yet, sometimes, dichotomous and even subpinnate. The aged parts

of the thallus are of a smoke grey, the younger paler, and snow-white beneath the edges. The segments are not so dilated as in *P. tenella*, Ach., and there are no *soredia* present.

24. *P. leiocarpa*, Tayl.; thallo orbiculari, cinereo-virescenti, rugoso, sublacunoso, lobis periphericis tenuibus, rotundatis, crenulatis, subtus albido-cinereis; gemmis granulatis demum cylindricis; apotheciis concavis, nudis, disco pallide castaneo, margine incurvo demum crenulato.

HAB. United States; *Greene, Hook. herb.*—Thallus 3-4 inches wide, coarsely wrinkled, the intervals again minutely wrinkled, whitish-ash coloured when dry, greenish when wetted: the inferior surface is whitish brown. Differs from both *P. saxatilis*, Ach., and *P. aleurites*, Ach., by the absence of the dense black tricæ beneath, and remarkably by the naked apothecia, on the margins and backs of which the buds do not appear.

25. *P. limæformis*, Tayl.; thallo sordide cinereo, cæspitoso, adscendente, lineari, dichotomo, apicibus acuminatis, subtus canaliculato, atro, gemmis granulatis confertis tecto atque scaberrimo.

HAB. Chiloe; *Cuming, Hook. herb.*—Thalli 2-3 inches long. The buds at first appear as black points, but soon become whitish elevated granules: short black tricæ occur very sparingly on the inferior surface.

26. *P. leucothrix*, Tayl.; thallo orbiculari, albido, depresso, lineari, multifido-laciniato, laciniis minutis, approximatis, crenulatis, breviter albo-ciliatis, subtus albis, gemmis concoloribus, granulatis; apotheciis marginalibus, planiusculis, disco rufescenti, margine demum crenulato, extus fibrillos albidos demittentibus.

HAB. On bark; St. Vincent's; *Rev. L. Guilding, Hook. herb.*—Patches 2-3 inches in diameter, exteriorly linear and radiating; at the centre the lobes are shorter: buds in very white, round grains. Apothecia sending down white rootlets from their backs, which fix themselves to the thallus as in *P. ulothrix*, Ach.; but this species has the surface

more brown, the laciniæ of the thallus wider, and the margins of the apothecia entire.

27. *P. livida*, Tayl.; thallo substellato, adnato, cinereo, nudo, rugoso, laciniis angustis, difformibus, periphericis sinuato-incisis, dichotomis atque retusis, subtus atrofibrillosis; gemmis concoloribus granulatis, demum explanatis; apotheciis sparsis, majoribus, demum planis, margine, gemmis compresso-granulatis, crenulato, disco livide purpurascenti.

HAB. On bark; New Orleans; *Hook. herb.*—Thallus resembling some states of *P. stellaris*, Ach., however, it is flatter and neither so stellate or so white. The apothecia are exteriorly smooth and are sessile, their margins thin, expanding and breaking up, the disk of a pale leaden-purplish colour.

28. *P. mamillata*, Tayl.; thallo cæspitoso, adscendente, substellato, pubescenti, albido-cinereo, laciniis linearibus, pinnatifidis, ciliatis, subtus canaliculatis, albidioribus, lævibus, venoso-lacunosis; gemmis granulatis, tumidis; apotheciis podicellatis, demum planis, disco fusco, margine subintegerrimo, extus pubescentibus.

HAB. From *Dr. Fischer*; *Hook. herb.*: also Canaries; *Dr. Lemann.*—Patch 3-4 inches wide, brownish ash-coloured, covered with a short concolorous pubescence, which, however, is wanting beneath. Ultimate branches often pedate; lobes very short, their terminations not attenuated as in *P. villosa*, Ach., nor terete as in *P. ephebea*, Ach., whilst the colour of the thallus is very different from that of *P. Atlantica*, Ach. Besides, on none of these three do mamillate granules occur. The apothecia are described from *Dr. Fischer's* specimens.

29. *P. mutabilis*, Tayl.; thallo suborbiculato, lævigato, cinereo, lobis difformibus, periphericis sinuato-laciniatis, convexis, subtus fuscescentibus, nigro-villosis; gemmis marginalibus, granulatis; apotheciis concavis, disco rufescenti, margine tenui incurvo, demum gemmis crenulato.

HAB.—No. 5. Uitenhage; *Zeyher, Hook. herb.*—Thallus sometimes two inches wide, variously lobed, sometimes linear, sometimes rotundate, but at the periphery usually inciso-sinuate, resembling in its mode of branching *P. conspersa*, Ach., but in colour and general habit approaching *P. herbacea*, Ach. The inferior surface is nearly black, and polished beneath the margins of the lobes.

30. *P. Nepalensis*, Tayl.; thallo cæspitoso, adscendente, lineari, dichotomo, lævigato, laciniis elongatis, convexiusculis, acutis, lutescenti-albidis, subtus nigris, rugosis, canaliculatis; gemmis minutis, subrotundis, apice nigropunctatis; apotheciis sparsis, substipitatis, disco concavissimo, castaneo, margine crenulato, inflexo.

HAB. Nepal; *Wallich.*—Tufts four inches high. Thallus increasing in breadth just before branching; ultimate branches lanceolate, beneath furnished with a few scattered, short, black, scabrous tricæ. This species is allied to *P. furfuracea*, Ach.; in which, however, the thallus is more flat, and the buds occur in crowded short cylinders, which are absent from our plant.

31. *P. ophioglossa*, Tayl.; thallo cæspitoso, adscendente, rufo, basi flavicante, subdichotomo, laciniis elongato-ellipticis, subacutis, margine recurvis, ciliatis, subtus canaliculatis, pulvere conspersis; gemmis submarginalibus statim in tricis apice nigras abeuntibus.

HAB. Monterey; California; *Capt. Beechey, Hook. herb.*—Thallus nearly two inches long, segments divaricating; above they are broader, flatter, and red, below nearly cylindrical and pale greenish-yellow: the powder in the channel beneath the lobes is reddish under the red parts, but snow-white under the yellowish parts. This has some resemblance to *Cetraria Islandica*, Ach.; but the analogy of the inferior surface is far greater with the *Borreræ* of Acharius.

32. *P. patinifera*, Tayl.; thallo subradiato, lobis lineari-oblongis, rotundatis, lobato-crenatis, albidis, madore

virescentibus, lævigato, inæquabili, subtus corrugato, margine albido, cæterum scabroso-fuscescenti; gemmis marginalibus, subrotundis, planis; apotheciis sessilibus, planis, castaneis, margine radiato-gemmiferis.

HAB. Organ Mountains; Brasil; *Gardner, G. J. Lyon, Esq.*

—Thallus five inches in diameter, deeply and irregularly divided into broad linear lobes. The upper surface has shallow unequal and irregular pits. Apothecia of a conspicuous size. Lobes of the thallus imbricated, but by no means sinuate.

33. *P. polycarpa*, Tayl.; thallo orbiculari, membranaceo, rugoso, albido-cinereo, virescenti, subtus centrum versus nigrescenti, exterius fixuris nigris devincto, sub ipso margine nudo, rugoso; gemmis marginalibus, granulatis, albidis; apotheciis demum concavissimis, extus rugosis, disco castaneo, margine tenui crenato-rupto, incurvo.

HAB.—On bark; Swan River; *Mr. James Drummond*.—Differs from *P. Borreri*, Ach., by the want of cup-shaped receptacles of the buds, and from *P. corrugata*, Ach., by the paler colour of the thallus, and less red disks of the apothecia, besides the lobes of the thallus are less rotundate.

34. *P. plumosa*, Tayl.; thallo stellato, cinerascenti, subtus subconcolori, fixuris nigrescentibus devincto, lobis plumoso-rugosis; gemmis subglobosis, pulveraceis, albidis; apotheciis minutis, concavis, disco nigro-pruinoso, margine crasso, incurvo, crenulato.

HAB.—On bark; Low Island; *Capt. Beechey, Hook. herb.*—Thallus 3-4 inches wide, lying closely adnate to the bark; lobes radiating, wrinkled. Beneath a black pruinose disk is a colourless lamina with a few erect blackish thecæ, resting on a layer of black matter as in *Lecanora Ceratonia*, Ach.; by which mark this species is certainly distinguished from *P. pulverulenta*, Ach., and from *P. stellaris*, Ach., as well as by the subglobose whitish soredia.

35. *P. palpebrata*, Tayl.; thallo substellato, cinereo, subru-

goso, laciniis vage ramosis, linearibus, convexis, cinereo-ciliatis, gemmis granulatis; scabro, subtus albo stuppeo; apotheciis podicellatis, concavis, disco nigrescenti, margine incurvo, subintegerrimo, ciliato, extus albido-pulveraceis.

HAB. No. 1467. Peru; *Cuming*. Jamaica; *Dr. Wright, Hook. herb.*—Thallus 3-4 inches wide. The ciliæ of the apothecia are short and in a young state lie across the disks. The *lamina proligera* is pale and pellucid, thickly set with dark thecæ and emerging above the disk of the apothecia.

36. *P. saccatiloba*, Tayl.; thallo orbiculari, albido-cinereo, gemmis minutis granulatis creberrimis scabriusculo, lobis obtuse complicatis, rotundatis, subintegris, margine recurvis, subtus fusco-nigro glabro, elevato-punctato; apotheciis sparsis, concavis, disco castaneo, margine crenulato, extus gemmifero.

HAB.—Pitcairn's Island; *Beechey*. Mauritius; *Dr. Wight*. Brazil, *Hook. herb.*—Thallus several inches wide, pale ash-coloured, unaltered when wetted. Buds tipped with a dark brown spot, lobes uneven with large convolutions, flaccid, somewhat saccate in appearance. Apothecia sessile, the border incurved, exteriorly very rough with buds. In characters it approaches *P. scortea*, Ach.; but the inferior surface is smooth, while the upper is far more convolute and uneven.

37. *P. subflava*, Tayl.; thallo substellato, albido-flavescente, rugoso, sublacunoso, subtus concolori, fusco-fibrilloso; laciniis sinuato-lobatis; gemmis marginalibus, confertis, elongato-granulatis; apotheciis sessilibus, concavis, demum explanatis atque margine gemmiferis.

HAB. Van Diemen's Land; *Mr. Borrer's herb.*—Thallus about half an inch in diameter; lobes imbricated and aggregated of adjoining individuals forming a wide patch on the bark of trees, dark cream-coloured, somewhat pitted and wrinkled; the tops of the laciniae rounded.

Buds crowded, sometimes slightly branched. This is a minuter species than *P. saxatilis*, Ach., nor has it the reticulated surface or retuse lobes of this species.

38. *P. stuppea*, Tayl.; thallo coriaceo, suborbiculari, fusco-rufescenti, rugoso, lobis repando-crenatis, intus rufescenti, stuppeo, subtus atro, lævigato, ruguloso; gemmis marginalibus, pulveraceis, demum olivaceis; apotheciis marginalibus, demum planis, disco atro, lævigato, margine tenui, undulato, incurvo, demum gemmifero, extus villosis.

HAB. Monterey, California; *Beechey, Hook. herb.*—Thallus 2-3 inches wide, very uneven, the central parts minutely wrinkled. Under the shining black cuticle of the inferior surface a red membrane occurs; between which and the upper surface of the thallus there is a pale brown, cottony substance, which is much compacted. Black trices may be observed beneath.

39. *P. sparsa*, Tayl.; thallo in maculam aggregato, albo, minutissimo, lineari, angulato, varie lacinulato, laciniis subconvexis extus latioribus, subtus atro-fibrillosis; gemmis granulatis, statim planiusculis; apotheciis sparsis, minutissimis, disco subfusco, marginem album integerrimum demum æquante.

HAB. On bark; St. Vincent's; *Rev. L. Guilding, Hook. herb.*—Thallus appears as a brown spot, on which the minutest white shreds or laciniae are scattered: the margins of these resemble a succession of white dots which are often confluent. Apothecia not visible to the naked eye. Allied to *P. elæina*, Ach.; but the thallus is far more minute and more scattered.

40. *P. tenuiscypha*, Tayl.; thallo suborbiculari, inciso-lobato, pallide castaneo, lobis margine undulatis, crenatis, sub-elevatis, vetustis rugosis, junioribus inæqualibus; gemmis albidis, pulverulentis sulcos brevissimos subsimplices complentibus; apotheciis majoribus, concavissimis, margine tenui, demum disrupto, disco pallide castaneo.

HAB. Macquarry River; *Mr. Robert Ball's herb.*—Thallus

3-4 inches wide, rugged, irregularly channelled, the edges waved and raised; the lobes subimbricated. From the European *P. sulcata*, Tayl., the present may be known by its browner colour, more channelled lobes, by the furrows in which the buds appear being more slender and more simple, whilst the buds themselves are white.

41. *P. Wallichiana*, Tayl.; thallo orbiculari, albo, glabro, subtus atro, hispido, lobis rotundato-sinuatis, crenatis; gemmis concoloribus, minutissime granulatis, demum elongatis; apotheciis sessilibus, fusco-castaneis, margine rupto, incurvo, gemmifero.

HAB. Nepal; *Wallich*.—Thallus 8-10 inches wide, coarsely wrinkled, smooth, decurved at the margins, whose terminations are brown and shining, cream-coloured, beneath blackish with very short hispid tricae. Lobes cuneate. Apothecia central, crowded, very concave, the disk reddish-brown. Ours differs from *P. scortea*, Ach., by the flatter thallus, whose lobes are less deeply divided, and more regularly crenate, by the short tricae of the inferior surface, and by the pale granulate buds which reappear on the margins of the apothecia.

CETRARIA, *Ach.*

I. *C. citrina*, Tayl.; thallo amplo, complanato, procumbente, pallide citrino, subtus albidiori, utrinque nudo atque laevigato, rugoso-lacunoso, lobis late linearibus, subdichotomis, canaliculatis; gemmis marginalibus, granulatis, statim complanatis atque thalli marginem fimbriantibus; apotheciis minutis, marginalibus, fuscis, demum convexis atque marginem thalldem subcrenulatum excludentibus.

HAB. On trees; Java; *Hook. herb.*—Thallus 5-6 inches wide. Lobes oblong, subsinuate, their margins at first entire, at length fringed with minute, concave, oblong buds. Below the thallus are a few, scattered, pale fibres. This species has somewhat the habit of a *Sticta*, but all the technical characters of *Cetraria* of Acharius.

STICTA, *Ach.*

1. *S. Wallichiana*, Tayl.; thallo amplo, suborbiculari, inciso-lobato, virescenti-cinereo, rugoso, sublacunoso, utrinque lævi, subtus concolori, rugosissimo; laciniis oblongis, laceris; cyphellis minutis, confertis, sessilibus, intus albis; apotheciis sparsis, minutis, confertis, disco castaneo, semipellucido, marginem tenuem integerrimum excludente.

HAB. Nepal; *Wallich*.—Thallus a foot wide; lobes linear, lacerous, their colour unaltered when moistened. Cyphellæ largely granular, sometimes confluent. This has the habit of *S. orygmæa*, *Ach.*; but the soredia of this species are yellow, and the margins of the apothecia are rugosocrenulate.

2. *S. rugulosa*, Tayl.; thallo cæspitose, procumbente, cinereo-virescenti, lineari, canaliculato, marginato, pinnato, laciniis dichotomis pedatisque; subtus nudo, glaberrimo; gemmis minutis, granulatis, albescentibus; apotheciis marginalibus, majoribus, demum planiusculis, disco fuscorufescenti, margine atque extus sinuato-rugosis, demum gemmiferis.

HAB. Peru; *Hook. herb.*—Thallus 2-3 inches long, pale ash-coloured with a greenish hue; no cyphellæ or soredia observable on the under side. Apothecia, when full grown disproportionately large, compared with the narrow laciniæ of the thallus; they are coarsely wrinkled on the margin and on their backs, the wrinkles waved and at length bearing minute, granulate, whitish buds. Ours resembles some states of *S. damæcornis*, *Ach.*, also *S. digitata*, *Hook. fil. et Tayl.*, but in no known species are the backs and margins of the apothecia so strongly wrinkled.

3. *S. quercifolia*, Tayl.; thallo stellato, inciso-lobato, cinereoglaucis, lævigato, subtus nigrescenti-tomentoso, lobis sinuato-pinnatifidis, sinibus subcircularibus; gemmis marginalibus, granulatis, statim explanatis; cyphellis concoloribus, ore demum marginatis, pulvere albissimo

refertis; apotheciis marginalibus, demum convexis, disco atro-rufo, margine crenulato, extus angulato-mamil-latis.

HAB. Ceylon; *Hook. herb.*—Patches 2-3 feet wide, consist-
ing of imbricated thalli; colour unaltered by moisture.
This species is laciniated as *Sticta damæcornis*, Ach.; but
the white contents of the cyphellæ and mamillated backs
of the apothecia are sufficiently distinctive.

4. *S. propaginea*, Tayl.; thallo oblongo, depresso, lævigato,
albido-cinereo, madore virescenti, subtus concolori, lobis
periphericis sinuato-incisis, sinubus circularibus, margine
elevatis; gemmis concoloribus, marginalibus, granulatis,
statim elongatis, linearibus, ramosis; cyphellis minutis,
albidis; apotheciis minutis, incarnatis, demum convexis
atque marginem thallodem tenuem crenulatum excluden-
tibus.

HAB. Surinam; *Hook. herb.*—Thallus 2-3 inches long, in
the central and entire parts concave or channelled, in the
exterior extremely subdivided. The minute flesh-coloured
apothecia are very remarkable. It has some resemblance
to *S. filicina*, Ach., but is by no means substipitate.

5. *S. nitida*, Tayl.; thallo stellato, fulvo-cinereo, lævigato,
marginem versus dichotomo, lobis linearibus, concavis,
apice bifidis, margine integerrimis, nigrescentibus, subtus
atro-glaucis, lanuginoso; sorediis minutis, sparsis, flavo-
albicantibus; apotheciis sessilibus, concavis, extus villosis,
disco rufescenti, margine tenui, integerrimo, lanuginoso-
crenato.

HAB. No. 1450. Chiloe; *Cuming, Hook. herb.*—Lobes 6-8
inches long, brownish ash-coloured, unaltered when wet;
the under surface dark dun-coloured. Young apothecia
rise as villose globules on the surface. This is plainly
allied to *S. damæcornis*, Ach.; it differs, however, by the
pale yellow soredia on the inferior side of the thallus.

6. *S. Humboldti*, Tayl.; thallo orbiculari, subintegro, intus
azureo, utrinque fusco-cinereo atque villoso, lobis amplis
rotundatis; cyphellis concoloribus; gemmis granulatis,

villum albescentem statim emittentibus; apotheciis confertis, extus villosis, sparsis, demum planis, disco rufescenti-fusco, margine subintegerrimo, villosis.

HAB. No. 259. South America; *Humboldt, Hook. herb.*—

This species has altogether the habit of *S. obvoluta*, Ach., which was collected by Menzies at the Straits of Magellan; it has, however, the following remarkable and distinctive characters; the thallus is unchanged in colour when moistened; it has true concave cyphellæ of a pale brown colour and the apothecia are scattered, not marginal.

7. *S. lutescens*, Tayl.; thallo orbiculari, inciso-lobato, luteo-viridi, lævigato, lobis oblongis, sinuato-crenatis, subtus fulvis, villosis; cyphellis concavissimis, intus flavescentibus; gemmis marginalibus, granulato-pulveraceis, statim ramosis, olivaceo-fuscis; apotheciis sparsis, extus villosis, demum convexis, disco rufescenti, marginem thalldem integerrimum demum excludente.

HAB. Java; *M. Spanoghe, Hook. herb.* Jamaica; *Purdie.*—

Thallus 6-8 inches wide, a little greener when moistened, incised almost to the centre, the margins elevated with crowded buds, whose dusky olive colour contrasts with the greenish tawney surface of the thallus. The buds are scarcely formed when they branch out and assume a browner colour; a character, joined to the tawney inferior surface, which will keep this species distinct from all described ones.

8. *S. Leylandi*, Tayl.; thallo substellato, cinereo-virescenti, subtus albido, lobis rotundatis, laciniatis, adscendentibus; gemmis pellucidis, albidis, filiformibus; apotheciis sessilibus, concaviusculis, disco castaneo, margine gemmis coronato.

HAB. Brazil; *Mr. R. Leyland's herb.*—Thallus rapidly imbibing moisture and becoming soft and flaccid, the upper surface nearly covered with buds in clusters connected by a membranous expansion. The aged apothecia receive a short podetium from the thallus; the disk is of a chestnut

colour when wet, brick red and puinose when dry. *Lamina proligera* pale, containing vertical cylindrical thecæ, whose summits scarcely reach to the disk. The thallus is furnished beneath with white filiform vessels, which appear like the surface of writing paper as viewed by a magnifying-glass; there are here, besides, subrotund bundles of olive-coloured radicles. There are no cyphellæ present.

9. *L. lacunosa*, Tayl.; thallo orbiculari, inciso-lobato, pallide virescenti-cinereo, minute lacunoso, lobis radiantibus, apice dilatatis, rotundatis, crenatis, subtus pallidis, subtomentosis; gemmis marginalibus, linearibus, planis, pallidis; apotheciis sessilibus, rufis, margine demum gemmis coronato.

HAB. Brazil; *Mr. R. Leyland's herb.*—Thallus membranaceous, thin, smooth, reticulated and pitted. Beneath there are convex papulæ and a whitish scattered down. Apothecia usually marginal. The *lamina proligera* is very thin. No cyphellæ present. Buds on the margins of the apothecia flat, subrotund, subconfluent.

10. *S. imbricatula*, Tayl.; thallo minuto, subimbricato, cinereo-virescenti, rugoso, lobis sinuatis, rotundatis, integerrimis, sinubus circularibus, subtus concolori, subviloso; sorediis minutis, flavis; apotheciis sparsis, demum planis, disco subfusco, margine tenui crenulato.

HAB. "No. 1662, ad arborum corticem in sylvis montium editioribus, Insulæ Juan Fernandez; Maio, 1830;" *Bertero in Hook. herb.*—Patches 2-3 inches wide, consisting of several imbricated thalli; their surface is very uneven, their margins decurved and entire, yet sinuate. The interior of the thallus is yellow. The apothecia have the habit of those of *Lecanora subfusca*, Ach. The soredia beneath the thallus are not easily detected.

11. *S. fimbriata*, Tayl.; thallo substellato, lobato, lobis ascenduntibus, imbricatis, undulatis, incisis, fimbriato-crenatis, glauco-cinereis, madore nigro-viridibus, pruino-

sis; gemmis substipitatis, subrotundis, granulatis, ad thalli marginem confertis; cyphellis rotundatis oblongisve, concavis, albidis, pruinosis, marginibus elevatis.

HAB. In woods near Killarney.—The marginal buds become flattened and sometimes branched, giving a fimbriated appearance to the lobes. The moistened surface is mottled by a white pruina peculiar to this species. The granules of the buds may often be observed to be tipped with dark-brown. Patches 3 inches or more in diameter, loose, attached by a central disk. It differs from *S. sylvatica*, Ach., by the more divided margin of the thallus, by its fimbriated appearance, its pruinoso-reticulated surface, and its very pale glaucous grey colour when dry.

12. *S. erythroscypha*, Tayl.; thallo stellato, inciso-lobato, cinereo-viridi, subtus margine concolori, centro nigro-villoso, lobis oblongis, sinuato-crenatis; sorediis punctiformibus flavis; gemmis marginalibus, granulatis, demum pulverem flavum effudentibus; apotheciis sparsis, demum convexis, disco intusque aterrimis, margine extusque rubris, subvillosis.

HAB. "No. 1609. Ad saxa in collibus, Insula Juan Fernandez, April, 1830;" *Hook, herb.*—Thallus 6 inches wide, incised nearly to the centre, surface smooth, slightly concave, parenchyma white; young apothecia nearly spherical, reddish-orange; the more aged flat or convex, their margin and the thallocal cup reddish, their disk and lamina quite black, and thus unlike that of any of its congeners.

13. *S. Drummondii*, Tayl.; thallo orbiculato, fusco-cinereo, subvillosa, inciso-lobato, lobis fertilibus marginem versus rugoso-lacunosis, subtus concolori, villosa; gemmis marginalibus granulatis; sorediis sparsis, albidis; apotheciis oblatis, terminalibus, resupinatis, disco castaneo, subplano, margine demum lacero.

HAB. On bark, accompanying *Nephroma polaris*, Ach. British North America; *Thos. Drummond, Hook. herb.*—

Thallus 4-5 inches wide, dusky fawn-coloured, the central parts duskier and nearly smooth, the marginal villose soredia subglobose, whitish, opening sometimes above and displaying a white cavity. Apothecia large, more wide than long, the disk very thin, the margin, at length, waved. This, as well as *S. sylvatica*, Ach., has the apothecia of a *Peltidea*, but the thallus of *Sticta* of Ach.; but ours is very distinct by the villose thallus, the globose soredia, the buds few and marginal, and the apothecia oblate.

14. *S. divulsa*, Tayl.; thallo fusco-cinereo, madore immutato, sinuato-inciso, dichotome pinnatifido, lacunoso-reticulato, lobis linearibus, marginatis, erecto-patentibus, glabris, nitidis, apice emarginato-bifidis, cæterum integerrimis; sorediis minutis, albidis; apotheciis marginalibus, disco convexiusculo, rufo-fusco, margine tenui integerrimo, extus papilloso-rugosis.

HAB. "No. 476. Chonos Archipelago; *Darwin*. Island of Huerffo; *Dr. Beck*." *Hook. herb.*—Thallus deeply divided. Sinuses oblong. From *S. pulmonacea*, Ach., ours is different by the narrower, more divaricating lobes and the white soredia beneath the thallus.

15. *S. denudata*, Tayl.; thallo orbiculari, cinereo-olivaceo, lævigato, complanato, rugoso, subtus villoso, sinuato, late lobato, sinubus minutis circularibus, lobis imbricatis, margine integerrimis; apotheciis marginalibus initio globosis atque diaphragmate occlusis, demum margine incurvis, gemmis crenulatis, extus pulveraceis, disco rufescenti.

HAB. No. 257. South America; *Humboldt*. Casapí, Peru; *Mathews*, *Hook. herb.*—Thallus 6 inches wide, uneven but not lacunose. Lobes vary in breadth. Buds not apparent on the thallus, but observed prolonging into fronds on the margins of the apothecia. Ours may be distinguished from the numerous varieties of *S. pulmonacea*, Ach., by the more considerable dark villi of the inferior

surface, by the upper not being lacunose, by the want of granulate buds on the thallus, and by the apothecia remaining very concave even in old age.

16. *S. calithamnia*, Tayl.; thallo suberecto, substipitato, plano, glaucescenti, madore fusco, subtus rufescenti, subvillosa, sublacunosa, ramosissimo, ramis sinuato-lacinulatis; cyphellis nullis.

HAB. On trees and stones; Juan Fernandez; *Hook. herb.*—In flattish tufts. Thallus about one inch long, much subdivided, the sinuses roundish. Allied to *S. filicina*, Ach.; our plant, however, is shorter, more subdivided, the ultimate laciniae are rounder, the inferior surface is more villose and presents no cyphellae.

17. *S. bicolor*, Tayl.; thallo orbiculato, lævigato, inciso-lobato, lobis sublaciniatis, laciniis brevibus, subangulatis, rufescenti-cinereo, subtus fuscescenti; cyphellis albidis, planis, margine elevatis; apotheciis marginalibus, disco rufo, margine integerrimo, subtus floccosis.

HAB. Organ Mountains; *Gardner, G. J. Lyon's herb.*—Thallus 4 inches wide, lobes scarcely one quarter of an inch broad, the central parts of an ash-grey, the extreme of a chestnut brown, but little deepened by moisture. The thick dark grey scabrous pubescence of the inferior surface of the thallus reappears on the backs of the apothecia. The smooth surface of the thallus and the crowded marginal sessile apothecia readily distinguish this species from *S. sylvatica*, Ach.

PELTIDEA, Ach.

1. *P. glaucescens*, Tayl.; thallo virescenti-glaucis, villosis, inciso-lobatis, lobis rotundatis, integerrimis, subtus albobutypeo; fixuris nigro-olivaceis; apotheciis terminalibus, planis, rotundis, fuscis, subcrenulatis.

HAB. No. 230. On dead wood; Diana's Peak, St. Helena; *Dr. J. D. Hooker.*—Thallus scarcely exceeding $1\frac{1}{2}$ inches in diameter, whitish-ash-coloured when dry, glaucous green when wet. Apothecia somewhat convex when aged.

This has the apothecia of *P. venosa*, Ach., and the thallus of *P. canina*, Ach.; but the inferior surface differs from that of either of these, being snow-white and cottony, except where the veins occur.

2. *P. pulverulenta*, Tayl.; thallo cinereo-livido, elevato-punctato, subtus concolori, subavenio, villosa, lobis subincisis, retusis; apotheciis concavis, disco atro-rufescenti, margine crenulato, extus verrucosis.

HAB. Pillzhum, Columbia; *Prof. W. Jameson*.—Thallus suborbicular, flaccid and rugose when wet. Apothecia on proper stalks of the thallus. Inferior surface villose as in the stictæ; the upper surface is thickly sprinkled over with subangular concolorous grains, not observed in its congeners.

3. *P. erumpens*, Tayl.; thallo orbiculari, cinereo-virescenti, inciso-lobato, lobis rotundatis subintegerrimis, subtus elevato-venosis; gemmis sorediatis, pulverem glaucum effudentibus, centralibus; apotheciis terminalibus, subpedicellatis, rotundis, convexiusculis, atro-purpureis, subintegerrimis.

HAB. On sides of clay banks; Dunkerron, county of Kerry.—Thallus 1-2 inches wide, glaucescent when wet, ash-coloured when dry, thin in structure; apothecia few. Buds central, five or six together, rarely confluent, round, shallow eruptions of the thallus containing a glaucous powder. By these buds it is separated from all known species.

DUFOUREA, Ach.

1. *D. plumbea*, Tayl.; thallo pulvinato, obscure plumbeo, ex centro affixo radiato-ramoso, erecto, lobis subsimplicibus, stuppeo-solidis, turgidis, clavatis, hic illic coarctatis impressisque, basi compressiusculis rugosisque; apotheciis terminalibus, subimmersis, planis, immarginatis, disco tenuissimo, pruinoso, viridi-atro.

HAB. On the ground; Bushman's Country, Cape of Good Hope; *Zeyher, Hook. herb.*—Thallus in madreporiform,

dusky olive tufts, about half an inch high; tops of the lobes rounded: sometimes on the white fractured surface whence the apothecia have fallen, several very minute, crowded, young, blackish apothecia are observable. Sometimes two adjoining lobes coalesce, as do the apothecia on their summits. *Lamina proligera* excessively thin, and dark green. Allied to *D. pruinosa*, Nees; but the flat immersed disks of the apothecia and the tuberculose and coarctate lobes of the thallus keep it very distinct.

2. *D. simplex*, Tayl.; thallo cæspitose, solidiusculo, pallidissime cinereo, tereti, filiformi, simplici, longitudinaliter corrugato; apotheciis in ramuli brevis apice terminalibus, disco concavo, concolori, margine integerrimo.

HAB. West coast of North America; *Menzies*.—Nearly two inches high, scarcely as thick as packthread. It has the habit of *Cenomyce gracilis*, Ach., but is not so acuminate, nor has it pale greenish granular buds.

CENOMYCE, Ach.

1. *C. sphaerulifera*, Tayl.; thallo foliaceo, minuto, cinereo-viridi, subtus albo, laciniis inciso-crenatis; podetiis cylindricis, angustis, simplicibus, cinereis, subpellucidis, glabris; gemmis albidis, minutissime granulatis, statim cylindricis; scyphis brevissimis; apotheciis conglomeratis, minutis, coccineis, madore nigris, substipitatis.

HAB. Demerara; *Mr. C. Parker, Hook. herb.*—This species appears distinct from *C. bacillaris*; Ach., by the more numerous and conglomerate apothecia, which are scarlet while dry, but turn black when wetted; and by the subpellucid podetia which are quite smooth, though sprinkled with buds.

2. *C. hirta*, Tayl.; podetiis erectis, filiformibus, villosis, cæspitosis, fusco-cinerascentibus, compresso-teretibus, ramosissimis; ramis patentibus, flexuosis, axillis imperforatis, ultimis minutis bi-tripinnatis; gemmis granulatis, subterminalibus, fuscis.

HAB. Casapí, Peru; *Mathews, Hook. herb.*—Thallus flaccid. The podetia are remarkable for being covered with short white villi, resembling those of the under side of a *Sticta*. This reminds one of *C. rangiferina*, Ach., growing, as it does, in rounded tufts: but the ultimate branches are not drooping; whilst the villose podetia are very distinctive.

3. *C. diatrypa*, Tayl.; thallo cæspitoso, erecto, fistuloso, dichotomo, ramosissimo, cinereo-fuscescente, ramis foraminulatis, ultimis acuminatis, fertilibus explanatis; apotheciis confertis, minutis, disco rufo-fusco, margine tenui, demum undulato.

HAB. Macquarrie River; *Mr. R. Ball's herb.*—Podetia in rounded, brownish, rigid tufts, from 2-3 inches high. Fertile branches flattened and variously wrinkled. The border of the aged apothecia at length assumes the colour of the disk.

4. *C. acuta*, Tayl.; thallo foliaceo, minuto, crenulato; podetiis subulatis, brevibus, ramosis, teretibus, fusco-cinereis, subpellucidis; gemmis confertis rufescenti-albidis.

HAB. Islands of the Pacific; *Hook. herb.*—Tufts dusky brown, rigid, scarcely 1 inch high. The buds may be observed expanding into minute crenulate scales at the bases of the *podetia*; these resemble in colour and semi-transparency shreds of glue: they are much acuminated and tipped with black. Allied to *C. pityræa*, *b. acuminata*, Ach., differing essentially by the subpellucid and brown podetia.

BÆOMYCES, Ach.

1. *B. Capensis*, Tayl.; thallo tartareo, areolato, cinereo, substrato tenui, atro, marginante; apotheciis demum globosis, umbilicatis, atris; stipite immerso.

HAB. Cape of Good Hope; on granite; *Hook. herb.*—Thallus more than two inches wide; areolæ tumid, very uneven, often having one or two dark depressed spots on the surface, which are rudiments of apotheciæ; little

altered by moisture. Apothecia on the scales, at first flat and bordered as in *Lecidea*, soon, however, globose, and excluding the border, rough, subpruinose, crowded; they are supported on a stipes of white cortical matter immersed in the crustaceous scales. Disk black, covering a very shallow, semi-transparent, striated lamina, resting on much black matter. Closely allied to *B. anomalus*, Tayl., in *Flor. Hib.*, which now ceases to be singular for having no conspicuous stipes; and which has the crust whiter and thinner, as well as more even, while the apothecia are paler, and when full grown not so convex.

2. *B. hyalinus*, Tayl.; thallo crustaceo, minuto, sublobato, pallide flavo-virescenti; gemmis subrotundis, apice fuscis; stipite compresso, subrugoso, madore hyalino, punctis opacioribus consperso; apotheciis subplanis, pallidissime carneis, margine albido, subintegerrimo.

HAB. On sandy clay; Swan River; *Mr. James Drummond*.—Patches wide. Apothecia crowded, variously twisted, oftener oblong than round. Stipes about half an inch high, from a narrow base expanding upwards, when dry opaque, pellucid when wet, sprinkled with granular opaque buds. Like *B. rupestris*, Ach., the footstalks of the apothecia are stouter, and remarkably hyaline when saturated with moisture: besides, the thallus is in sublobate crustaceous scales.

ALECTORIA, Ach.

1. *A. tuberculosa*, Tayl.; thallo cinereo, ligulato, elongato, striato, scabro; gemmis granulatis, convolutis, confertis, albidis; apotheciis marginalibus, podicellatis, concavis, disco pruinoso, concolori, margine tenui, undulato, integerrimo.

HAB. No. 1469. Peru; *Cuming, Hook. herb.*—Thallus 6-8 inches long, coriaceous, with longitudinal elevated ridges, which at length burst along their tops. Podetia very considerable; hence, though with some doubt, it is now

referred to *Alectoria* and not to *Ramalina*, whose habit, however, it strongly possesses.

2. *A. virens*, Tayl.; thallo pendulo, elongato, filiformi, tereti-compresso, subdichotomo, implexo, pallide virenti, hinc canaliculato, ad angulos compresso, ramulis ultimis setaceis, flexuoso-curvatis, apice nigricantibus; gemmis in thalli canaliculo pulveraceis, concoloribus; apotheciis minutis, convexis, fuscis, immarginatis.

HAB. Sheopore, East Indies; *Wallich*.—Tufts loose, dull green, more than one foot long, rough with short, setaceous branches tipped with black. It is very bitter, and imparts a green tinge to the saliva when masticated.

3. *A. spinosa*, Tayl.; thallo erecto, tereti, lævissimo, subtus canaliculato, basi cinereo, apice fuscescenti, ramulis fuscis, setaceis, acuminatis, striatis, rectiusculis; gemmis raris, granulatis; apotheciis ad thalli angulos sessilibus, concavis, subtus lævibus, disco rufescenti-fulvo, albido-pruinoso, margine tenui, crenulato.

HAB. Nepal; *Wallich*.—Tufts loose, 3-4 inches high; thallus branched at the base, often dichotomous above. Apothecia as large as peas, some with a reddish-brown lamina, all of them covered with a white pruina. The loruli are shorter and straighter than in any of the congeners.

RAMALINA, *Ach.*

1. *R. canaliculata*, Tayl.; thallo cæspitoso, glabro, nudo, subtus canaliculato, lineari, subdichotomo, albo-lutescenti, ramulis acuminatis; gemmis marginalibus granulatis, statim spiculiformibus; apotheciis marginalibus, podicellatis, concavis, margine gemmis granulato.

HAB. Veragua; *Sinclair*, California; *Menzies*. Tahiti; *Beechey*, *Hook. herb.*—Loosely tufted, pale tawney, nearly six inches long; stems split at the margins, and there shewing a whitish powder; but the true buds are few, marginal and granular, and soon change into spines, the young rudiments of thallus: the branches form an obtuse angle with the main stem. It may be known from *R. fas-*

tigiata, Ach., by the narrow, semiterete thallus; and the marginal apothecia not being limited to the upper branches.

2. *R. leucosticta*, Tayl.; thallo pendulo, glabro, plano, filiformi, dichotomo, longitudinaliter rugoso, olivaceo-rufescenti, madore pellucido, ramulis incurvis; gemmis minutissimis, albis, numerosissimis; apotheciis marginalibus, minutis, planis, rufescentibus, pellucidis, margine tenui, integerrimo.

HAB. Tahiti; *Beechey, Hook. herb.*—Tufts 1-3 inches long; the younger parts olive-coloured, the more aged reddish-brown. Thallus channelled beneath. In no described species are the soredia so minute, so crowded, or so white.

3. *R. Menziesii*, Tayl.; thallo compresso, lævigato, nudo, elongato, cinereo, laciniis filiformibus, planis, reticulosoconnatis; gemmis marginalibus, oblongis, pertusis, statim reticulatis; apotheciis substipitatis, marginalibus, demum convexis, subimmarginatis, lutescentibus.

HAB. Monterey, California; *Menzies.*—Tufts pendulous. Thallus more than one foot long, varying in breadth, smooth, longitudinally striated with whitish lines. Young lobes completely netted. Buds at first granulate, soon elongated and stipitate, and their pertused substance expanding into a net-work. Apothecia occur on the more aged branches, semi-pellucid, but their footstalks opaque.

4. *R. prolifera*, Tayl.; thallo pendulo, elongato, plano, ancipiti, lineari, acuminato, cinereo, albido-punctato, lævi, nudo, subrugoso, apice prolifero; surculis basi angustatis, linearibus, obtusiusculis; gemmis marginalibus terminalibusque; apotheciis marginalibus, cinereo-carneis, demum convexis atque marginem tenuem integerrimum excludentibus.

HAB. Uruguay River; *James Baird, Hook. herb.*—Thallus $1\frac{1}{2}$ foot long, devoid of lustre, from a truncate extremity sending out three or more new shoots; when moistened

the surface is found to be strewn over with minute grey soredia. Apothecia of the size of rape-seed.

5. *R. pilulifera*, Tayl.; thallo e centro communi cæspitose, cinereo-stramineo, erecto, lineari, plano, longitudinaliter rugoso, subtus canaliculato, ramis filiformibus, acuminatis; gemmis minutis, oblongis, albidis, pulveraceis; apotheciis concoloribus, minutis, marginalibus terminalibusque, demum convexo-subglobosis marginem excludentibus.

HAB. No. 1642. In montibus excelsis Insulæ Juan Fernandez; *Hook. herb.*—Tufts 1-2 inches high, rounded; branches irregular; laciniae very narrow; minute depressions and longitudinal wrinkles occur especially on the back of the thallus.

6. *R. pellucida*, Tayl.; thallo compresso, lævigato, nudo, lineari, albido, subpellucido, striato, ramis acuminatis; gemmis marginalibus, statim lineari-lanceolatis; apotheciis submarginalibus, concaviusculis, subimmarginatis pallide luteis.

HAB. Brazil; *Mr. R. Leyland's herb.*—Tufts pendulous. Thallus 6-8 inches long, here and there perforated. Buds at first granulate. Apothecia substipitate, usually marginal, the disk pruinose. The thinner and pellucid thallus and the thallocal stipes to the apothecia readily distinguish this lichen from its European congeners.

CORNICULARIA, *Ach.*

1. *C. lata*, Tayl.; thallo glabro, albido, tereti, subanguloso, ramosissimo, ramis ultimis minutis, subfastigiatis, divaricatis; gemmis linearibus, utrinque acuminatis, albis, elevatis; apotheciis podicellatis, extus gemmiferis, disco concavo fusco-carneo, margine incurvo, crenulato.

HAB. Mexico; *Hook. herb.*—Thallus 2-3 inches in diameter, white and slightly greenish, unaltered by moisture. Apothecia frequently proliferous of a single shoot beneath, very concave; the disk dark brown when dry, assuming a paler colour, and carneous hue when moistened. This species, which has the apothecia of a *Borreria* of Acharius

on the thallus of a *Cornicularia*, can scarcely be confounded with any other.

USNEA, *Ach.*

1. *U. tumidula*, Tayl.; thallo cinereo, subcæspitoso, erecto, filiformi, dichotomo, glabro-tuberculato, hic illic diffracto, intus albidissime stuppeo-fasciculoso, ramis ultimis brevibus, spiniformibus, apice nigris; gemmis compresso-granulatis, lævibus, demum pulverem albidum effundentibus; apotheciis minutis, nudis, sessilibus, demum planis, pruinosis, concoloribus, margine demum crenulato.

HAB. No. 1474 (in part). Coquimbo; *Cuming, Hook. herb.*—Tufts dense, rigid, 1-2 inches high. Thallus cylindrical, with irregular smooth swellings and depressions; these last appear to be the buds, discharging a white powder. This has the branching of an *Alectoria*, *Ach.*, but the central thread of an *Usnea*.

2. *U. pectinata*, Tayl.; thallo pendulo, filiformi, tereti, cinereo, ramis simplicibus, subflexuosis, longissimis, fibrilloso-pectinatis, subcomplanatis, fibrillis tenuissimis, confertis, apice setaceis, subdecurvis; gemmis granulatis, statim spiciformibus.

HAB. Sylhet; *Wallich.*—Tufts 1-2 feet long, matted together. Main stem broken transversely into minute joints. This approaches in characters to *U. longissima*, *Ach.* from Lusatia, which we have not seen; but from description it would appear to be whiter, its stem more scabrous, and the fibrils of the branches more tortuous.

3. *U. nidifica*, Tayl.; thallo pendulo, elongato, lutescenti-ochraceo, lævi, pinnato, ramis patentibus, filiformibus, tortuosis, implexis, scabris; gemmis sorediiformibus, minutis, innovationibus hic illic breviter fasciculatis.

HAB. Norfolk Island; *Hook. herb.*—1½ feet long; branches capillaceous at their tops: stems transversely broken at the inferior parts, quite smooth; germinating buds clustered here and there, giving a peculiar and prominent character.

4. *U. miliaria*, Tayl.; thallo cæspitoso, erectiusculo, cinereo, tereti, ramosissimo; gemmis granulatis, confertissimis; ramis ultimis acuminatis, subglabris; apotheciis sessilibus, concoloribus, pruinosis, demum planis, extus scabris, margine nudo, demum crenulato.

HAB. No. 1477. Arica; *Cuming, Hook. herb.*—Thallus 3-4 inches long, irregularly and repeatedly branched, rough, as a file with thickly set whitish grains or buds. Apothecia usually proliferous of a single shoot from beneath. By the naked apothecia ours is allied to *U. melaxantha*, Ach.; but it is smaller; the thallus is not wrinkled and the apothecia are not reticulated beneath.

5. *U. flexuosa*, Tayl.; thallo pendulo, implexo, cinereo, filiformi, ramosissimo, subnoduloso, ramis brevibus, flexuosis; gemmis minutis, granulatis; apotheciis concoloribus, tenuissimis, planiusculis, pruinosis, margine ramoso-ciliatis.

HAB. Near Quito; *Prof. W. Jameson.*—Tuft soft, 4-5 inches long. Thallus very slender, rather smooth, except where the granular buds occur. Apothecia excessively thin: the buds on the margin elongating into a ciliary thallus which is at length branched. It is allied to *U. florida*, Ach., but is softer, smoother, finer and more flexuose; while the apothecia are almost as thin as cuticle.

6. *U. compressa*, Tayl.; thallo pendulo, lineari, compresso, cinereo, dichotomo, elongate articulato, ramis basi angustatis, acuminatis, patentibus; gemmis granulatis; apotheciis terminalibus, planiusculis, concoloribus, pruinosis, margine ciliatis, extus lævibus.

HAB. Nepal, *Wallich*; Mysore, *Dr. Wight*; Norfolk Island, *A. Thompson*; *Hook. herb.*—Thallus 4-5 inches long, ultimate branches short, at right angles to the stem, joints attenuated at each end, rough with numerous granular buds. The flattened thallus and jointed stems distinguish this from *U. florida*, Ach.

7. *U. densirostra*, Tayl.; thallo cæspitoso, erecto, viridivivaceo, abbreviato, ex basi disciformi ramoso, infra incrassato, supra acuminato, ramis subuliformibus, densis-

simis, subpatentibus, gemmis granulatis statim elongantibus; apotheciis terminalibus, concavis, disco albido, margine gemmis ciliato.

HAB. No. 686. Monte Video; *Darwin, Hook. herb.*—Scarcely 2 inches high; branches clothed all round with nearly equal and parallel, thickly set, subulate laciniae. Apothecia small. By its stunted growth, its crowded laciniae, and by its comparatively small apothecia, it may be distinguished both from *U. scabrida*, Tayl., and *U. florida*, Ach.

8. *U. scabrida*, Tayl.; thallo erectiusculo, scaberrimo, pallide cinereo-flavescenti, fibrillis confertissimis, curvato-adscendentibus, subramosis; gemmis minutissime granulatis, statim subulatis; apotheciis demum planiusculis, ciliis confertis margine dorsoque tectis, disco albido-stramineo, pulverulento.

HAB. Swan River; *Mr. James Drummond.*—About one inch high, fastigiate, very rough. Apothecia sometimes nearly half an inch wide. The fibrils on the thallus and on the margins of the apothecia are truly buds elongating into new individuals. The abundance of these buds on the backs of the apothecia will serve to separate the present from *U. florida*, Ach.

COLLEMA, *Ach.*

1. *C. trachyopum*, Tayl.; thallo squamoso, squamis frustuloso-areolatis, scabridis, fuscis, minutis, sublobatis; apotheciis minutis, immersis, demum sessilibus, disco concavo, rufescenti, nigro-pruinoso, margine incrassato, scabro, elevato.

HAB. On limestone; Dunkerron, county of Kerry.—Patches about one inch wide, thin, closely adnate, blackish, cracked when dry. Scales light brown, studded with dark points, which, at length, enlarge into flattish granular buds. Differs from *C. nigrum*, Ach., by the want of the bluish border; nor are the scales ramulose towards the

centre; nor is the border of the apothecia thin, shining, and at length evanescent; nor is there any blackish-brown matter beneath the *lamina prolifera*.

2. *C. maritimum*, Tayl.; thallo pulvinato, gelatinoso-membranaceo, olivaceo, marginem versus glaucescenti, lobis minutis, imbricatis, rotundatis, margine incrassatis, undulatis, subintegerrimis, convexis, minute rugosis; gemmis majoribus granulatis; apotheciis confertis, minutis, immersis, disco flavescenti-brunneo.

HAB. On limestone near the sea; Dunkerron, county of Kerry.—Patches 1-3 inches wide, when moistened nearly one inch high, when dry flat, thin and membranous. Lobes concave beneath, the marginal distinct, the central cohering, all of them minutely wrinkled and covered with punctiform elevations, which at the edge of the disks of the apothecia cause the margins to appear crenulate. The substance of the thallus contains numerous, filiform, moniliate, slightly waved bodies: such as are observable in several species of *Collema*, and are made by some botanists to characterize the genus *Nostoc*. The disk is dark yellowish-brown, pruinose with elevated points; the lamina pale brown, thickly striated, resting on a thin concolorous layer, which, however, is more opaque. This is by far the most gelatinous species known.

3. *C. reflexum*, Tayl.; thallo foliaceo, crasso, albido-glaucoscenti, minutissime ruguloso, subtus fusco, tomentoso, lobulis oblongis, subintegris, margine reflexis, sublacunosus; gemmis granulatis; apotheciis confertis, centralibus, concavis, disco rufo, margine crasso, elevato, granulato-crenato.

HAB. No. 837. Java; *Zollinger, Hook. herb.*—Thallus 2-3 inches wide, substellate, coriaceous, having a white pruina on the extreme lobes: surface most minutely and longitudinally wrinkled, and it has thickly set depressed blackish points. On the inferior side is a dark brown down as in the *Stictæ*. The present appears sufficiently distinct from

C. exasperatum, Ach. ; if we may judge by the characters ; but we have not seen the plant.

4. *C. erythrophthalmum*, Tayl. ; thallo viridi-olivaceo, minuto, tenui, adscendente, lobis confertis, subimbricatis, sinuato-laciniatis, multifidis ; gemmis marginalibus, granulatis, lutescentibus ; apotheciis planis, podicellatis, subtus nudis, disco rubello, margine subintegerrimo, aurantiaco.

HAB. On trees ; Philippine Islands ; *Cuming, Hook. herb.*—Thalli aggregated ; lobes very thin, jagged. The lamina is naked beneath ; and the cup which contains it is not formed of the thallus. The fine red apothecia, with their orange border, render this species conspicuous among its congeners.

5. *C. corticola*, Tayl. ; thallo foliaceo, membranaceo, bulloso, minutissime rugato, glauco-plumbeo, lobis rotundatis, adscendentibus, integerrimis, complicatis, laxis, flexuosis ; apotheciis confertis, disco rufo, margine integerrimo, incurvo.

HAB. Ohio ; *Lea, Hook. herb.*—Thallus 3-4 inches wide, monophyllous, divided into rounded, concave, entire lobes : when moistened the colour changes to a pale olive ; and the surface exhibits short, simple or branched, elevated, obtuse wrinkles ; which, however, are not acutely pinched up, nor so thickly set as in *C. rugatum*, Tayl. ; nor is the thallus so pale ; while the lobes are more entire.

6. *C. crassiusculum*, Tayl. ; thallo foliaceo, gelatinoso, crasso, demum gemmis obtuse plicatis tumidis rugoso, fusco-olivaceo, lobis rotundatis, adscendentibus, integerrimis, subtus rugosis ; apotheciis sessilibus, majoribus, fusco-rufescentibus, margine granulato, demum rugoso-plicato.

HAB. Madras ; *Dr. Wight, Hook. herb.*—Patches 2-3 inches wide : lobes numerous, ascending, complicated, thick, gelatinous, subpellucid when moistened. Apothecia large in proportion to the lobe on which it grows, sometimes occupying $\frac{1}{3}$ of its surface : the disk when dry nearly black. Differs from *C. favosum*, Ach., by the more gelatinous and

thicker thallus, which is wrinkled on both sides, as well as by the rugose and thicker border of the apothecia.

7. *C. cæspitosum*, Tayl.; thallo cæspitoso, pulvinato, fusco-olivaceo, suborbiculari, imbricato-plicato, plicis centralibus erectis, integerrimis, utrinque elevato-rugosis, margine undulato-plicatis, asperis, siccitate nigrescentibus atque subtus glaucescenti-albicantibus; apotheciis marginalibus, concavissimis, margine incrassato, granulato, disco nigrescenti-purpureo.

HAB. In forests; Uitenhage; Cape of Good Hope; *Zeyher, Hook. herb.*—Thallus 1-2 inches wide. The thallus is more thick and carnose than in *C. lacerum*, Ach. By its marginal apothecia it is allied to *C. fasciculare*, Ach.; but the lobes are more round, and never inciso-crenate.

8. *C. vesicatum*, Tayl.; thallo gelatinoso-membranaceo, elastico, subtenaci, plumbeo, utrinque vesicato-plicato, rugoso, lobis procumbentibus, oblongis, subinciso-crenatis; gemmis concoloribus elongato-granulatis; apotheciis minutis, subpodicellatis, confertis, fulvis, margine crasso, integerrimo, extus gemmis scabro.

HAB. On aged trees; St. Vincent's; *Hook. herb.*—Thallus 3-4 inches wide; longitudinally plaited when dry; but when wetted the wrinkles expand into elongated vesicles. Allied to *C. rugatum*, Tayl. It is, however, more procumbent: the plaits when wetted are more obtuse; and the buds are far larger and longer.

9. *C. olivaceum*, Tayl.; thallo foliaceo, membranaceo, utrinque lævi, tenuissimo, olivaceo, pellucido, lacunoso, lobis adscendentibus, integerrimis; gemmis marginalibus granulatis; apotheciis sparsis, subtus nudis, concavis, disco rufo, margine crasso, integerrimo, lutescenti.

HAB. No. 252. South America; *Humboldt, Hook. herb.*—Thallus about 2 inches wide, very thin yet gelatinous when moistened, with elevated ridges containing concave depressions, pellucid even when dry. The tawney thick shell containing the lamina lies on a ring of the thallus, but is quite naked beneath. Very like a *Nostoc*.

10. *C. Turneri*, Tayl.; thallo foliaceo, membranaceo, gelatinoso, rugoso, amethystino, lobis confertis, erectiusculis, complicatis, integerrimis; gemmis granulatis, compressis, tumidis; apotheciis podicellatis, subtus nudis, disco concolori, margine atque extus gemmis tumentibus rugosis coronato.

HAB. On trees; Tahiti; *Beechey, Hook. herb.*—Patches several inches wide. The younger thallus very pale olive-green, the more aged of an obscure amethystine hue: the buds that cover the apothecia are of different colours in proportion to their ages, some pale olive-green, others reddish, others again purplish-blue. Allied to *Stephanophorus Kraussii*, Flotow, and to *St. dædaleus*, Flotow; but its colour, its pellucid thallus, and its soft consistence like that of a *Tremella*, serve easily to distinguish it.

Notes of ALGÆ, observed at various altitudes in Aberdeenshire, by G. DICKIE, M.D., Lecturer on Botany in the University and King's College of Aberdeen.

The heterogeneous assemblage, entitled *Infusoria*, has of late years been very much broken up. Botanists of high authority have asserted their right to rescue many of them from the hands of the Zoologist; and they contribute in no small degree to increase the numbers of the *Algæ*. It is not intended in this paper to enter upon any discussion respecting the arguments for and against the title of the *Desmidiæ* to a place in the Animal kingdom: those in favour of their vegetable nature seem to be stronger than those advanced by the Zoologist in laying claim to them. At the same time it cannot be denied that both classes of naturalists have shown a tendency to adopt that mode of reasoning called 'begging the question.'